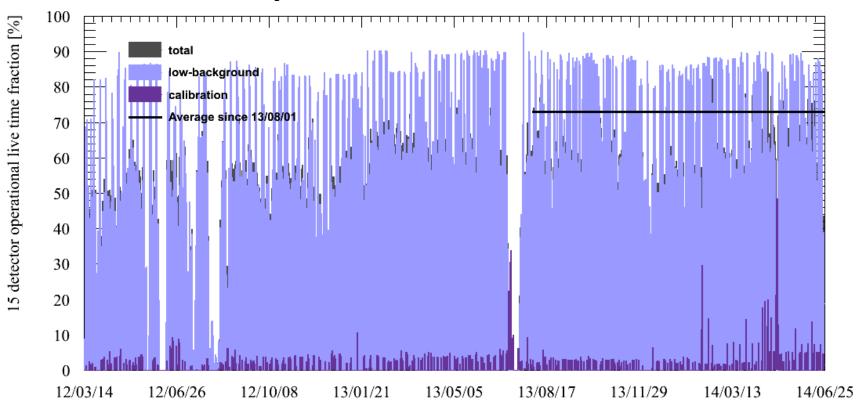
Cosmic Frontier Experiment Status

June 30, 2014

Experiment	Location	Status	Start of operations	Nominal end of	Physics
SuperCDMS	Soudan	Operating	Mar 2012	Mar 2015?	Dark Matter
COUPP/PICO 2L	SNOLAB	Operating	Dec 2013	Dec 2014?	Dark Matter
COUPP/PICO 60	SNOLAB	Operating	June 2013	Dec 2015?	Dark Matter
Darkside 50	LNGS (Gran Sasso)	Operating/ Calibrating	Jan 2014	Dec 2016?	Dark Matter
DAMIC	SNOLAB	Operating	Dec 2012	Dec 2015	Dark Matter
Dark Energy Survey	CTIO, Chile	Operating	Sep 2013	Feb 2018	Dark Energy
Pierre Auger	Argentina	Operating	2008	2015 (for FNAL)?	High Energy Cosmic Rays
Holometer	Meson Lab	Commissioning	Spring 2014	2015	Spacetime

SuperCDMS Soudan

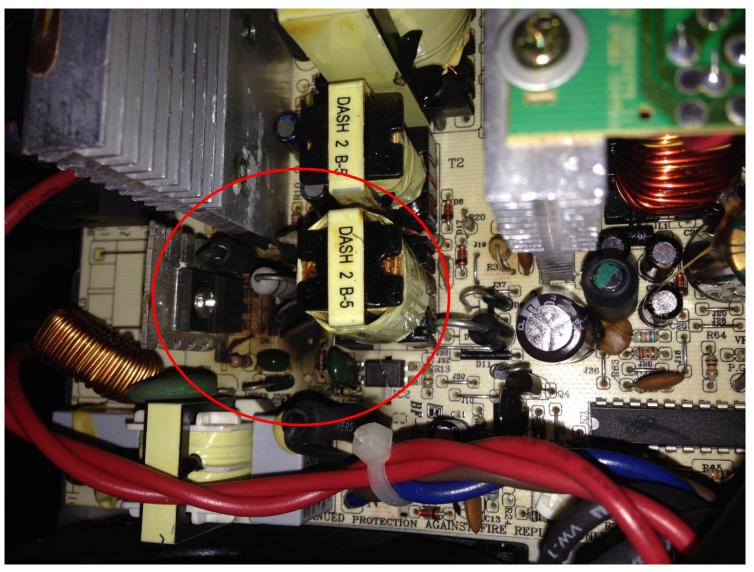


Continuing normal data-taking
Lost ~18 hours last week to DAQ control
computer failure

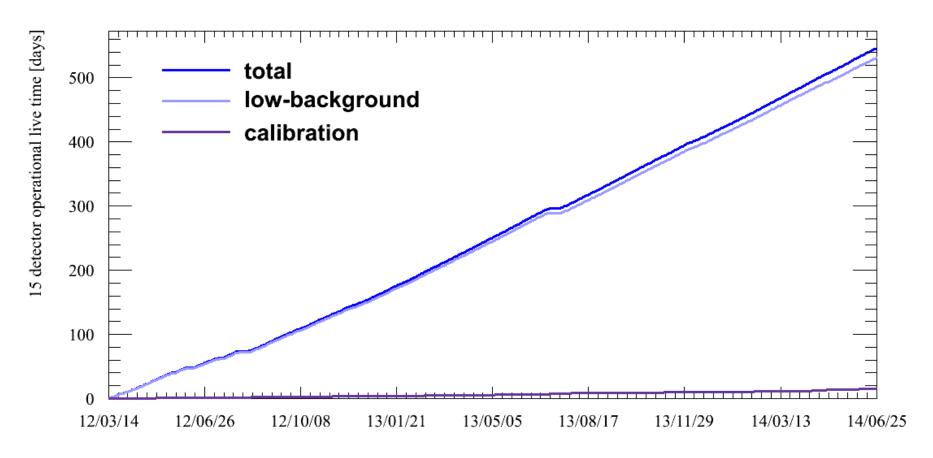
Contributions to the dead-time include:

10% due to calibration with gamma and neutron sources10% to maintain detector charge collection5-8% for maintenance and special data sets

Toasted power supply



SuperCDMS Soudan



Integrated live time (days) since beginning of operations

Detector mass is approximately 9 kg Ge, so WIMP exposure =13.1 kg-years

COUPP/PICO Operations Summary

COUPP60 and PICO2L runs completed in May

- Auxiliary temperature measurement of PICO-2L completed in early June
- Now working on careful particulate sampling
 - Main work in last few weeks has been understanding system to make clean blank samples before extracting the water from COUPP60 and PICO-2L – this is ongoing
- Next step after sampling is a refill of PICO-2L with a new buffer fluid (LAB liquid scintillator instead of water)
 - The goal is to improve operational performance to improve data quality
- COUPP60 plan will be determined once sampling results are in hand

Example of particulate found in SNOLAB clean room air 150x zoom



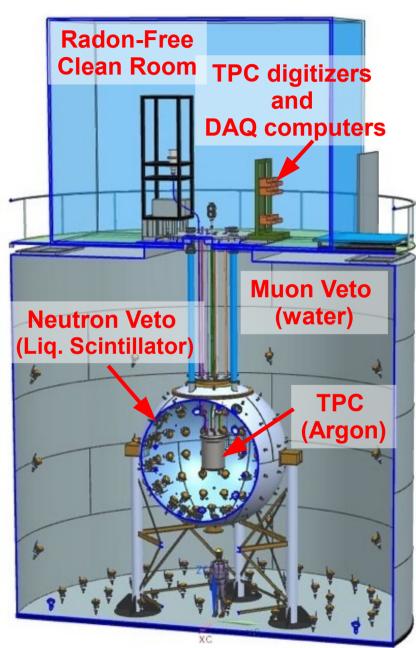
DarkSide-50 Status



- Main operation: TMB removal
- Neutron Veto (TMB and PC mixture)
 - Observed a high 14C rate due to TMB
 - Originally 50% of TMB
 - TMB removal and filling with new PC
 - Distillation plant:
 - Purification of new PC batch. DONE
 - Separation of old PC from the TMB: ONGOING:

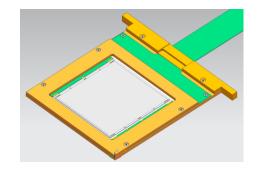
Achieved 1% of TMB
Aiming towards 0.1% of TMB

- Scheduled to be finished by end of July.
- TPC: Used to monitor TMB removal

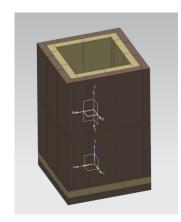


May-June 2014

- DAMIC-100 detectors fabrication completed
 - First batch already at Fermilab
 - Flex circuit in production at Cordoba: defective cable. The company will deliver a new set, produced at their expense, next week.
 - Will start packaging the CCDs on July.



- Current setup dominated by 210Pb background
 - Ancient lead pieces machined at Uchicago, shipped to Snolab, on the queue to be taken underground.
 - Low radioactivity lead pieces from Zurich ready shipped to Snolab, currently at Canadian customs.
 - Installation at Snolab during July.



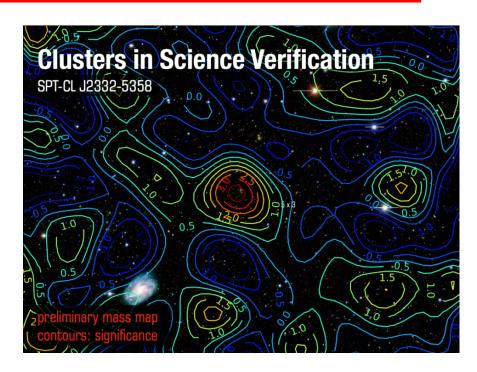
Status: taking data with prototype detectors. Uptime >95%. High quality data.



Dark Energy Survey

DARK ENERGY SURVEY

- August 30, 2013 < Season 1 < February 10, 2014
- Now DECam is being used by other experiments/projects until DES restarts in August 15, 2014.
- We have the schedule from CTIO
- Meanwhile, DES is
 - Working on completion of science publications. 3 submitted. See 1st one to right. one accepted so far. One more in collaboration wide review.
 - Y1A1 processing started June 10.
 - Preparing for Y2 observations

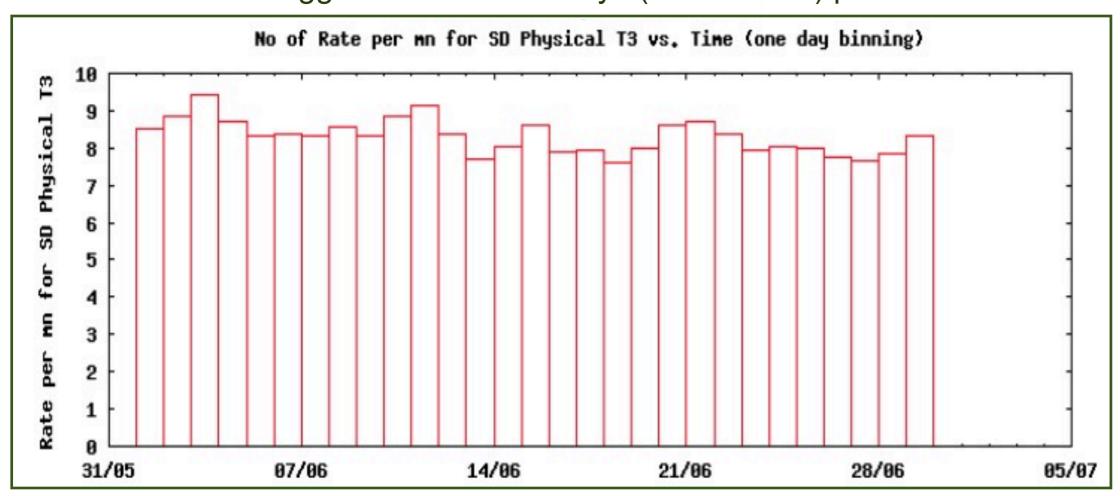


Melchior, P., et al., "Mass and galaxy distributions of four massive galaxy clusters from Dark Energy Survey Science Verification data", arXiv:1405.4285.

Pierre Auger Observatory

Activities between June 1 - June 29

- SD efficiency: 98.9% efficiency in the past five weeks, on-going maintenance, upgrade R&D activity (involves SD) continuing in the field, very stable.
- Recent FD observation period: May 19 June 7; smooth, high wind warning for May 29
 June 17 July 7; smooth, rain on June 25
 - remote shift operational at Wuppertal (Germany), construction in Frascati (Italy) & Karlsruhe (Germany), other places considered (US location: PSU & CSU).
- Collaboration meeting @ Golden, CO large progress made on upgrades
- ❖ June I 29: Number of triggers from cosmic rays (E > 10¹⁸ eV) per minute ~ 12000 / day



Holometer (E-990) Commissioning Status:

Interferometer angular alignment control now implemented

- Makes interferometer control much less susceptible to wind noise.
- Previously, dropping a pebble on the ground could kill the interferometer lock.
- Now, can operate even with a large fan blowing on the east hut enclosure.

Stability is still an issue.

- Dominant mechanical resonances change weekly for as yet unknown reasons
- Lock acquisition requires new characterizations of the instrument's state.

Some fixes create new problems

- Implemented temperature control at T=37C to soften rubber in the mechanical isolation system and thus improve the mechanical damping.
- Differential thermal expansion of an in-vacua aluminum optic mount caused the optic to become loose and slowly slip out.

High current photoreceivers now can operate at 150 mA DC photocurrent.

- Space-charge saturation effects mitigated by using larger area photodiodes.
- Can now take full advantage of the photostatistics → resolution = 10⁻¹⁸ m/rtHz

Beginning program of identifying and mitigating sub-shot-noise backgrounds